



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,215	11/25/2003	Bhamidipaty K.D.P. Rao	00014DIV(3600-267-02)	5519

7590 10/19/2005  
Martha Ann Finnegan, Esq.  
Cabot Corporation  
157 Concord Road  
Billerica, MA 01821-7001

EXAMINER

JENKINS, DANIEL J

ART UNIT	PAPER NUMBER
----------	--------------

1742

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/721,215

Applicant(s)

RAO ET AL.

Examiner

Daniel J. Jenkins

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 1742

1. The Examiner has carefully considered Applicant's Response of 9/23/05. The Examiner finds that the temperature range takes the nitriding step outside the prior art of the last rejection. The Examiner notes the pending invention departs from the majority of the prior art in that the nitriding takes place prior to deoxidation. At this time, the Examiner makes a new rejection to meet this limitation, this rejection accordingly not made final.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fife '044 (Fife).

Fife discloses the invention substantially as claimed.

Fife discloses a method of forming a nitrided valve metal comprising:

- providing a niobium powder (col. 3, lines 41-42);
- nitriding the niobium powder (col. 3, lines 47-57);
- deoxidizing the niobium powder (col. 3, line 52); and
- sintering at 1500-1300°C to form a sintered niobium capacitor (col. 6, line 62 to col. 7, line 6).

Fife discloses that the nitriding can be performed at any or multiple processing stages (col. 3, lines 49-51), and thus allows for nitriding during melting of the ingot, thus limiting the oxygen uptake of the powder as desired in the art, establishing a prima facie case of

Art Unit: 1742

obviousness. Fife additionally discloses that the powder can be nitrided by exposure to air during the degassing of the ingot chip, thus motivating one of ordinary skill to nitride early in the forming process.

Fife further discloses wherein nitriding can take place during a thermal treatment of 70°C to 500°C.

Fife further disclose an example wherein nitriding takes place prior to oxidation in a nitrogen atmosphere prior to deoxidation (col. 18, lines 9-35), this nitriding taking place at a higher temperature than the range as claimed by Applicant, but the Examiner finds that the nitriding by air during passivation meets the pending claims.

Fife further discloses wherein the nitrogen content of the powder should be between 300-5,000 ppm (col. 4, lines 10-16).

Fife discloses thermal agglomeration at 1250°C (col. 17, lines 4-8), and allows for nitriding during this step.

Fife discloses sintering at 1300°C and 1450°C (see TABLE 6), and allows for nitriding during this step.

Fife further discloses hydrogen degassing and passivation after powder formation.

Fife further discloses wherein nitriding can be accomplished by nitrogen gas or nitrogen compounds (col. 3, lines 58-61).

Fife is silent as to temperature change rate during nitriding, allowing one of ordinary skill in the art to select a rate that would result in a homogeneous nitriding during thermal cycling.

Art Unit: 1742

4. Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fife in view of Chang.

Fife discloses the invention substantially as claimed (see paragraph 3 above).

However, Fife does not disclose application of his method to tantalum (Ta), but only to niobium (Nb).

Fife discloses wherein both nitrided Ta and Nb powders are used in the past to form capacitors (see Background), and Fife discusses limitations in the past to substituting Nb for Ta in forming capacitors. Fife states that a need exists for improving Nb in forming capacitors, and directs his invention to improving Nb powders, and is silent as to application of his invention to Ta powders. The Examiner does not find this as a teaching away from application of his method to Ta powders, but merely a method of improving Nb powders.

The prior art is clear that Nb and Ta behave similarly to formation and nitriding steps, and one of ordinary skill in the art would expect the method of Fife to perform similarly on either starting material.

Chang teaches to that one of ordinary skill can select Ta as the initial valve metal instead of Nb when desiring to produce a capacitor of a leakage capacity within the characteristics of a nitrided Ta based capacitor.

Thus one of ordinary skill would substitute Ta for Nb starting materials in order to form a capacitor of the leakage capacity of Ta.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Jenkins whose telephone number is 571-272-1242. The examiner can normally be reached on M-TH6:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1242. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel J. Jenkins  
Primary Examiner  
Art Unit 1742

dj